MASSAGE IN THE TREATMENT OF RECENT PERIARTICULAR FRACTURES.[1]

By GEORGE WOOLSEY, M.D.,

OF NEW YORK,

SURGEON TO BELLEVUE HOSPITAL; PROFESSOR OF ANATOMY AND CLINICAL SURGERY IN THE CORNELL UNIVERSITY MEDICAL COLLEGE.

THREE years ago, I read a paper before the Surgical Section of the New York Academy of Medicine on "Massage in the Treatment of Fractures,"[2] giving a preliminary report on the cases so treated. I had commenced the trial of the method over a year before, after reading Lucas Championnière's book[3] on the subject. I was led to the use of the method by the feeling that, in spite of the great advances made in other branches of surgery, little, if any, had been made for a generation in the treatment of fractures, and that the results of the present orthodox treatment were oftentimes decidedly unsatisfactory, especially in periarticular fractures.

The advantages claimed for the treatment by massage were certainly striking, and, if borne out in practice, would be a great advance on the ordinary method of treatment. Some of these advantages were, shortening of the time of repair by one-third and of functional use by one-half or more, the avoidance of stiff joints, atrophied muscles, obstructed circulation, etc.

The idea of massage and mobilization is so diametrically opposed to that of immobilization that a brief repetition of the statements of Championnière relative to the two methods of treatment may not be out of place. He claims that immobilization (1) relieves only the primary pain due to the movements of the fractured ends on one another, and allows or favors the secondary pain due to swelling of the surrounding parts. (2) It only imperfectly restores the original form of the part, especially in fractures near joints, when the swelling may reproduce the deformity. (3) It does not favor the repair of bone or the restoration of function, but, on the contrary, causes scantiness of callus,—sometimes the cause of delayed union or non-union,—and results in stiffness of the neighboring joints, atrophy of the muscles of the limb, and disturbances of the circulation which require time and patience to overcome.

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[1] Read before the New York Surgical Society, April 25, 1900.

[2] Medical News, New York, March 20, 1897.

[3] Traitement des fractures par le massage et la mobilization.

On the other hand, he claims that a certain amount of motion is favorable to the repair of bone, and that massage, in addition to furnishing this, prevents atrophy of the muscles, reduces swelling, and restores the circulation. In this and other less clearly known ways it causes the repair of bone to be rapid and, in combination with passive motion, prevents the stiffness of the neighboring joints.

Apart from the fact, shown by M. Canay's experiments, that fractures in dogs treated by immobilization in splints do not heal, we have the well-known facts that of all fractures in human subjects those of the ribs, in which complete immobilization is impossible, heal most surely, and that in cases of delayed union we employ movement to bring about union.

Certain contraindications are admitted by Championnière, such as the compounding of fractures, the presence of large blebs or a projecting fragment, great mobility, and the tendency of the deformity to be reproduced. It is unnecessary to repeat here the description of the method of the application of massage which I have given in the paper alluded to.

In fractures of the shafts of the long bones of the extremities, we have an improvement on the older methods in the ambulatory splint, by the use of which the atrophy of the distant muscles, as those of the thigh in a case of fracture of the leg, is prevented, and the general condition and the circulation are improved by not confining the patient to bed. The joints, too, though stiff at first and requiring massage and passive motion to make them supple again, readily yield to such treatment when they are neither injured nor in close proximity to an injury.

Certain fractures, especially the oblique fractures of both bones or the only bone of a limb, require a retentive apparatus to prevent the sliding by or longitudinal displacement of the fragments, and thus are not suitable to massage until some consolidation has occurred, requiring ten days to three weeks. When one bone of the arm or leg is fractured and is splinted by the other bone, massage may be applied in most cases from an early date. But it is in the common periarticular fractures that the method of immobilization gives the worst functional results; although it may be improved, but often not entirely relieved, by after treatment. Fractures of the shafts of the long bones I have treated for the most part by methods in common use. It was in these periarticular fractures, of which we have a common example in Pott's fractures of the ankle among hospital interne patients, that it seemed to me the need of improvement in treatment was most called for. The application that I have made of the massage treatment has been largely with Pott's fractures of the ankle, of which I have more or less complete notes of forty-seven cases. I have not treated all cases of Pott's fracture by this method, nor have all the cases in which it was used been treated exactly alike.

In the first place, I have seen no reason for discarding splints or retentive apparatus between the applications of massage before the patient is allowed up. In fact, it gives a greater sense of security to the patient as well as to the surgeon to feel that in the intervals between the application of massage displacement of the fragments is prevented by a splint. The casting aside of splints in connection with massage treatment by Championnière is the act of an enthusiast in a new method discarding the paraphernalia of the old. In none of the cases of Pott's fracture treated by massage has the splint been regularly discarded before the patient is allowed up. A Volkmann splint is the kind usually employed. It is evident from the mechanics of the foot that any deviation from the normal position is incompatible with normal function. Hence, a chief aim should be to put and keep a Pott's fracture in the best possible position. So important do I consider this, that if, on account of free posterior displacement or lateral mobility, the ankle cannot be or is not kept in good position by the splints used between the periods of massage, I do not hesitate to put it up at once in plaster. This may be necessary at the outset for the first ten days or more, or after massage has been applied for a time. Our zeal to prevent stiffness should not lead us to disregard the position of the parts or to cause non-union. That the latter is possible from too vigorous passive motion, I am quite sure. I have seen it twice, in two consecutive cases, during the past winter after massage had been used for three weeks, and when the passive motion had probably been too vigorous, as I had insisted on its importance in obtaining a good functional result. It should be begun and increased cautiously and applied carefully. As far as the functional result is concerned, I have found it far better to put up in plaster first and massage afterwards, than the reverse. In cases treated by plaster for ten days or so and then massaged, the result is nearly as good and as speedily obtained as in those cases massaged from the first, while in those cases first massaged for one to three weeks and then put up in plaster for two weeks, the stiffness of the joints and atrophy of the muscles are well marked when the plaster is taken off, though not as extreme as when the limb is kept in plaster from the first. In my list of forty-seven cases of Pott's fracture the time of commencement of massage after receipt of the injury is mentioned in forty-three cases, and ranged from at once to seventeen days, averaging three days after the injury. At the time of writing my former paper, most of the literature on the subject was confined to French and German sources. In looking over the literature since that date, several reports are to be found in English and American journals. The reports of those who have given the method a trial is entirely favorable so far as my investigations have gone. It is natural to expect that Championnière, the method's most enthusiastic advocate, would go farther than many of his followers in the general application of the method. It is interesting to note the limitations many apply to its application. Thus, among Championnière's Parisian colleagues, Péan,[1] confirming the excellence of the results obtained, thought the method especially useful when there was not great displacement, and Labbé[1] in periarticular fractures. The *Lancet* (London) editorially remarks that "if massage is exalted into the chief place in the treatment of fractures, and correction of displacement is regarded as of only minor importance, we fear its wider employment will be attended with much harm." It then adds, "of all the evil consequences of fractures of the bones of the limbs none is more common or more painful than the stiffness which is so often met with." Caldwell[2] thinks it most applicable to fractures in the vicinity of joints and in fractures of the clavicle. Angelesco[3] does not massage fractures with displacement until after fifteen to twenty days, and Buscarlet[4] often leaves fractures immobilized ten to twenty days. As to the results, Gould[5] says truly that "the real standard by which we ought to judge our results is the perfection of function of the part." Miller, using the massage treatment at the Edinburgh Royal Infirmary, reports that the object is mainly to prevent stiffness after union, and so to save time for the patient, which amounts to two weeks at the minimum. Angelesco finds that callus is regularly formed, but not excessive; that massage prevents excessive callus, and that in fit cases it gives incontestibly better results than immobilization. In his experience, Pott's fractures require twenty-eight to thirty days for complete consolidation and normal function. Bennett finds the same period of time sufficient in fractures of both bones of the leg. He also finds that massage relieves the muscular spasm so common and so distressing in the early stages of fractures, and which may render impossible the relation of the fragments in any proper position. Passive motion, he says, in addition to preventing stiffness of the joints, causes an "internal massage by the movement of the muscles and tendons, especially about the fracture." The objections to the method he characterizes as of no surgical moment, and in this I concur; but it is proper to mention some of them. For hospital patients, from the point of view of the hospital, more time is required than if the fracture cases are at once sent out with plaster splints; but from the point of view of the patients much time is gained in union of the fracture, and especially in the functional use of the limb. It has been suggested that non-union would be more common, but the opposite is the universal judgment of those who have tried it, who find that union is more speedy and firm. It is true that, as Miller found in one case, the deformity of a Pott's fracture may reoccur from too early and free use of the leg in walking, and it is wise to exercise some caution and supervision until union is firm at the end of the fourth week. Of course, it is not equally applicable to each case, and every case must be judged by itself.

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[1] Bull. Acad. de Méd., Paris, 1897, iii, S. xxxviii, 678-685 and 695-698.

[2] Railway Surgeon, 1898.

[3] Arch. d. Soc. Méd. de Bucarest, Paris, 1897, ii, 207-213.

[4] Rev. Méd. de la Suisse Rom., Geneva, 1897, xvii, 752-755.

[5] Lancet, London, 1897, i, 1599-1602.

The question of expense has been raised as an objection to the treatment by massage. Undoubtedly, it requires the more frequent attendance of the surgeon during the first four weeks; but then the need of his services should be unnecessary, and the time and better functional result gained by the patient, as well as the avoidance of the long-continued after-treatment to relieve stiffness, atrophy, etc., more than counterbalance the greater initial expense, in my opinion. To be sure, a very busy surgeon might find the time required an objection, but one easily overcome by employing an assistant, and only supervising the treatment himself.

In the forty-seven cases of Pott's fracture in which I have observed the effects of the treatment by massage, the age ranged from seventeen to sixty years, and averaged thirty-six years. More or less posterior displacement was noted in twelve cases, and lateral displacement in seven cases. One case treated last winter had most extreme lateral displacement, but, as it was readily kept reduced, massage was employed with an excellent result. In eight cases splints or plaster were employed for from four to seventeen days before massage was commenced. In one case massage was used for twelve days, then plaster for twenty days, and then again massage; while in four cases plaster was applied after three weeks of massage, in two for faulty position, and in two for non-union. The results have been excellent. Save one discharged improved at his own request at an early date, all have been cured after a treatment in the hospital averaging twenty-five days and a fraction over. As a rule, the histories simply state that the patient was discharged cured, but in fourteen good bony union is noted, in ten cases "no deformity," in eighteen perfect motion, and in five a slight limp. It is interesting to note the date of first being allowed up out of bed. This averaged nineteen and three-quarters days after the injury, and ranged between a couple of weeks and thirty-three days. Of course, when first allowed up, they walked on crutches, and then with canes, a varying length of time, depending upon the condition at the seat of fracture, and the time elapsed after the injury. Exceptionally cases allowed up on the twentieth or twenty-first day have walked off at once without support or limp. I think, however, that there is danger in letting them walk too freely without support at an early date. These results have been obtained by massage applied largely by the male and female nurses of Bellevue Hospital, and in spite of the fact that as they change from year to year none become as expert as if they continued to apply it from year to year.

In fracture of the patella, I know of no treatment for general use which yields better results as to union and function than massage combined with elastic compression at first, and passive motion later. One case so treated was discharged in twenty-four days with firm union and almost perfect motion, and when shown, five weeks after the injury, to the Surgical Section of the New York Academy of Medicine, the union was apparently bony and the function perfect. In none of the other four or five cases similarly treated have the results been quite so remarkable, but they compare more than favorably with that obtained by other methods. In the last case thus treated refracture occurred after several weeks, while the patient was trying to kick a cat, and the fragments were then sutured.

There are perhaps no articular and periarticular fractures in which the functional results are likely to be as bad as in fractures into or near the elbow-joint. I have treated some of these fractures, including those of the olecranon, by massage and passive motion with such good results that I am convinced that it is by far the best method for these bad cases.

In Colles's fractures of the radius, the conditions are especially favorable to treatment by massage, and the results uniformly good after its use. These cases may be treated without splints from the first, with only a bandage around the wrist. When so treated, the functional results are said to be perfect, and, though some deformity may persist, it is not greater than after the splint treatment. Personally, I see no reason why we should omit the attempt to reduce any bony deformity in these fractures, and employ retentive splints for the first week or ten days.

Although I have used massage in treating fractures of the neck of the femur, especially to overcome muscular spasm, I have not used it systematically as the only treatment. Each case must be judged by itself, and in many the ambulatory method seems theoretically best suited, though often not easy of application. I refer to the alcoholic and aged in whom confinement to bed is detrimental. I have also noted the good effect of treatment by massage in a few cases of fractures near or involving the knee- and shoulder-joints.

Finally, though I have applied the massage treatment principally to periarticular fractures for the reasons given above, I have also found it equally successful in a limited number of fractures of the shafts of the long bones where there was no great amount of deformity.

Why, then, is not this method more extensively used? Several factors may help to explain it. The traditional belief in the necessity for complete rest and immobilization does not appear at first sight consistent with massage. The impression on the part of the laity that the surgeon is responsible for a perfect result in the treatment of fractures, has resulted in malpractice suits being more common on account of a poor functional result after a fracture than in any or perhaps all other branches of surgery. Hence, surgeons are ultra-conservative and slow in adopting any but the stereotyped methods of treatment; whereas, I am firmly convinced, the very thing patients desire most, a good functional result, can be more safely assured in cases treated by early massage and passive motion.

In conclusion, I may say that with an increased and increasing experience I am more than ever satisfied with the results of this method, and can more conscientiously and warmly advocate its more extended use. As stated before, I see no advantage in discarding splints in the early period of the treatment. Their use gives confidence to the patient and the surgeon alike, and a sense of security that no displacement is likely to occur. We should pay particular attention to the position of the limb by carefully reducing any deformity, and keeping it reduced during massage and between the periods of massage, when the limb is in a splint. If this is not possible from the outset, after a preliminary massage, plaster should be applied, and kept on for from eight to fourteen days, and then massage commenced. The result in these cases is better as far as position is concerned, equally good functionally, and nearly, if not quite, as quickly obtained as when massage is employed from the first. If, again, after massaging for some time, the position is found to be imperfect, or if, after three weeks, quite firm union has not taken place, I believe in using a plaster splint for eight to fourteen days, though the functional result is thereby delayed.

The application of massage and passive motion is easy. It relieves pain and swelling, hastens callus formation and solidification, and prevents atrophy of the muscles and stiffness of the joints and tendons.

With the above restrictions on the practice of Championnière, I believe that the treatment of fractures, especially articular and periarticular fractures, by massage and passive motion gives the best and quickest result as to bony union and function of any method of treatment in vogue.